

CLAIMS

What is claimed is:

1. A subscriber station for a wireless RF data transmission system, said subscriber station comprising:

- a spindle extending upwardly from said subscriber station;
- a housing rotatably mounted to said spindle, said housing having an open side and comprising a heat sink;
- at least one emissions shielding enclosure secured within said housing;
- an RF communications board mounted in said at least one enclosure;
- an antenna array mounted to a first side of said at least one enclosure, said array operatively connected to said communications board through said at least one shielding enclosure for communicating RF data signals; and
- a radome secured over a face of said antenna array, sealed to said housing.

2. The subscriber station of claim 1 wherein said RF communications board comprises an RF receiver mounted in said at least one enclosure.

3. The subscriber station of claim 1 wherein said RF communications board comprises an RF transmitter mounted in said at least one enclosure.

4. The subscriber station of claim 1 wherein said RF communications board comprises an RF transmitter mounted in one of said at least one enclosures and an RF receiver mounted in another of said at least one enclosures.

5. The subscriber station of claim 1 further comprising:
means for controllably rotating said station on said spindle.

6. The subscriber station of claim 5 wherein said rotating means comprises an electric motor mounted within said housing and operatively engaging said spindle.

7. The subscriber station of claim 5 further comprising:
means for aiming said antenna array by controlling said rotating means.

8. The subscriber station of claim 7 wherein said aiming means is disposed within said housing.

9. The subscriber station of claim 1 further comprising:
an analog to digital converter operatively connected to said RF communications board;
and
a digital to analog converter operatively connected to said RF communications board.

10. The subscriber station of claim 9 wherein said analog to digital and said digital to analog converters are mounted on an opposite side of said at least one enclosure from said antenna array mounted on said first side of said at least one enclosure.

11. The subscriber station of claim 1 further comprising:
filtering circuits associated with said communications board.

12. The subscriber station of claim 11 wherein said filtering circuits comprise at least one surface acoustical wave filter.

13. The subscriber station of claim 11 wherein said filtering circuits comprise at least one finite impulse response filter.

14. The subscriber station of claim 1 wherein at least one emission shielding enclosure dissipates heat from said RF communications board.

15. The subscriber station of claim 1 wherein said heat sink comprises heat dissipation fins defined by a back wall of said housing.

16. The subscriber station of claim 1 further comprising:
a gasket captured between sealing surfaces of said housing and said radome, sealing said radome and said housing as a unitary enclosure.

17. The subscriber station of claim 15 wherein said gasket is carbon impregnated to block RF and electromagnetic interference from entering and exiting said subscriber station.

18. The subscriber station of claim 1 further comprising:
a breathing orifice sealed with a waterproof, breathable membrane allowing moisture to escape said housing and preventing moisture infiltration through said orifice into said housing.

19. The subscriber station of claim 1 wherein an interior of said housing is coated with heat absorbing paint facilitating dissipation of heat from within said housing.

20. The subscriber station of claim 1 wherein said spindle is secured to a fixed overhead bracket.

21. The subscriber station of claim 20 wherein said subscriber station is generally cylindrical and said overhead bracket covers a top of said subscriber station acting as a weatherhead.

22. The subscriber station of claim 1 wherein said subscriber station is suspended adjacent to a vertical surface, spaced apart from said surface, allowing convective heat flow around said station to dissipate heat from said heat sink.

23. A wireless RF data communication system subscriber station comprising:

means for RF communication of said data;

means for forming at least one antenna beam, said antenna beam forming means operatively connected to said communication means to communicate said RF data;

mean for enclosing said RF communication means to shield emissions from and to said antenna beam forming means, said antenna beam forming means mounted to said enclosing means;

means for housing said enclosing means and said antenna beam forming means mounted thereto, said housing means comprising means for covering said antenna beams means, while allowing communication on said antenna beams; and

means for controllably rotatably mounting said housing means.

24. The subscriber station of claim 23 wherein said beam forming means comprises means for forming a plurality of antenna beams.

25. The subscriber station of claim 23 further comprising means for aiming said antenna beam forming means by controlling rotation of said mounting means.

26. The subscriber station of claim 25 wherein said aiming means is disposed within said housing means.

27. The subscriber station of claim 23 further comprising means for converting analog RF signals to digital signals and digital signals to analog RF signals, said converting means mounted to an opposite side of said enclosing means from said antenna beam forming means.

28. The subscriber station of claim 23 wherein said enclosing means further comprises means for dissipating heat produced by said RF communication means.

29. The subscriber station of claim 23 further comprising means for filtering said RF communication of data.

30. The subscriber station of claim 29 wherein said filtering means comprise at least one surface acoustical wave filter.

31. The subscriber station of claim 29 wherein said filtering means comprises at least one finite impulse response filter.

32. The subscriber station of claim 23 further comprising:
means for allowing moisture to escape said housing means; and
means for preventing moisture infiltration into said housing means.

33. The subscriber station of claim 23 wherein said enclosing means further comprises means for dissipating heat from said RF communication means.

34. The subscriber station of claim 33 wherein an interior of said housing means comprises means for absorbing heat from within said housing means for dissipation out of said housing means.

35. A subscriber station for a wireless RF data transmission system, said subscriber station comprising:

- a fixed, overhead secured spindle;
- a housing controllably rotatably mounted to said spindle, said housing having an open side and comprising a heat sink;
- a plurality of emission shielding enclosures secured within said housing;
- an RF receiver mounted in a first of said enclosures;
- an RF transmitter mounted in a second of said enclosures;
- an antenna array mounted to a first side of one of said enclosures, said array operatively connected to said RF receiver and said RF transmitter through said enclosures to communicate RF data signals on at least one of a plurality of antenna beams produced by said array;
- an analog to digital and digital to analog converter mounted to an opposite side of said enclosures from said array;
- a radome secured over a face of said antenna array, sealed to said housing; and
- means for rotating said subscriber station and aiming said array.

36. The subscriber station of claim 35 wherein said rotating means comprises an electric motor mounted within said housing operatively engaging said spindle, and logic for aiming said array.

37. The subscriber station of claim 36 wherein said aiming logic is disposed within said housing.

38. The subscriber station of claim 35 wherein said enclosures further comprise means for dissipating heat produced by said RF receiver and said RF transmitter.

39. The subscriber station of claim 35 wherein each of said enclosures comprise an enclosure body sealed by an enclosure lid.

40. The subscriber station of claim 39 wherein said array is mounted to a lid of one of said enclosures.

41. The subscriber station of claim 39 wherein said lid of at least one of said enclosures is comprised of at least a portion of said body of another one of said enclosures.

42. The subscriber station of claim 35 further comprising:
filtering circuits associated with said transmitter and said receiver.

43. The subscriber station of claim 42 wherein said filtering circuits comprise at least one surface acoustical wave filter.

44. The subscriber station of claim 42 wherein said filtering circuits comprise at least one finite impulse response filter.

45. The subscriber station of claim 35 wherein said heat sink comprises heat dissipation fins defined by a back wall of said housing.

46. The subscriber station of claim 35 further comprising:
a gasket captured between sealing surfaces of said housing and said radome sealing said radome and said housing as a unitary enclosure.

47. The subscriber station of claim 46 wherein said gasket is carbon impregnated to block RF and electromagnetic interference from entering and exiting said subscriber station.

48. The subscriber station of claim 35 further comprising:
a breathing orifice sealed with a waterproof, breathable membrane allowing moisture to escape said housing and preventing moisture infiltration through said orifice into said housing.

49. The subscriber station of claim 35 wherein an interior of said housing is coated with heat absorbing paint facilitating dissipation of heat from within said housing.

50. The subscriber station of claim 35 wherein said spindle is secured to a fixed overhead bracket.

51. The subscriber station of claim 50 wherein said subscriber station is generally cylindrical and said overhead bracket covers a top of said subscriber station acting as a weatherhead.

52. The subscriber station of claim 35 wherein said subscriber station is suspended adjacent to a vertical surface, spaced apart from said surface allowing convective heat flow around said station to dissipate heat from said heat sink.